

**SCHEMATIC
DIAGRAM**

CRUMAR[®]
Musical Instruments

**mod.
T3**



FEMALE CONNECTOR SYMBOL (es. J 2/1)



PLUG IN CONNECTOR SYMBOL



WIRE SOLDERING POINT



TEST POINT (T P...)



CONNECTING POINT (ON p.c.b.)



METALLIC FILM RESISTOR 1%

ALL resistors 1/4w unless otherwise indicated

ALL tab switches shown in OFF position

ALL key switches shown in OFF position

See part list for component part numbers

**CRUMAR RESERVES THE RIGHT TO CHANGE
SPECIFICATIONS AND DESIGNS, WITHOUT
NOTICE AND LIABILITY.**

**SCHEMATIC
DIAGRAM**

mod.
T 3

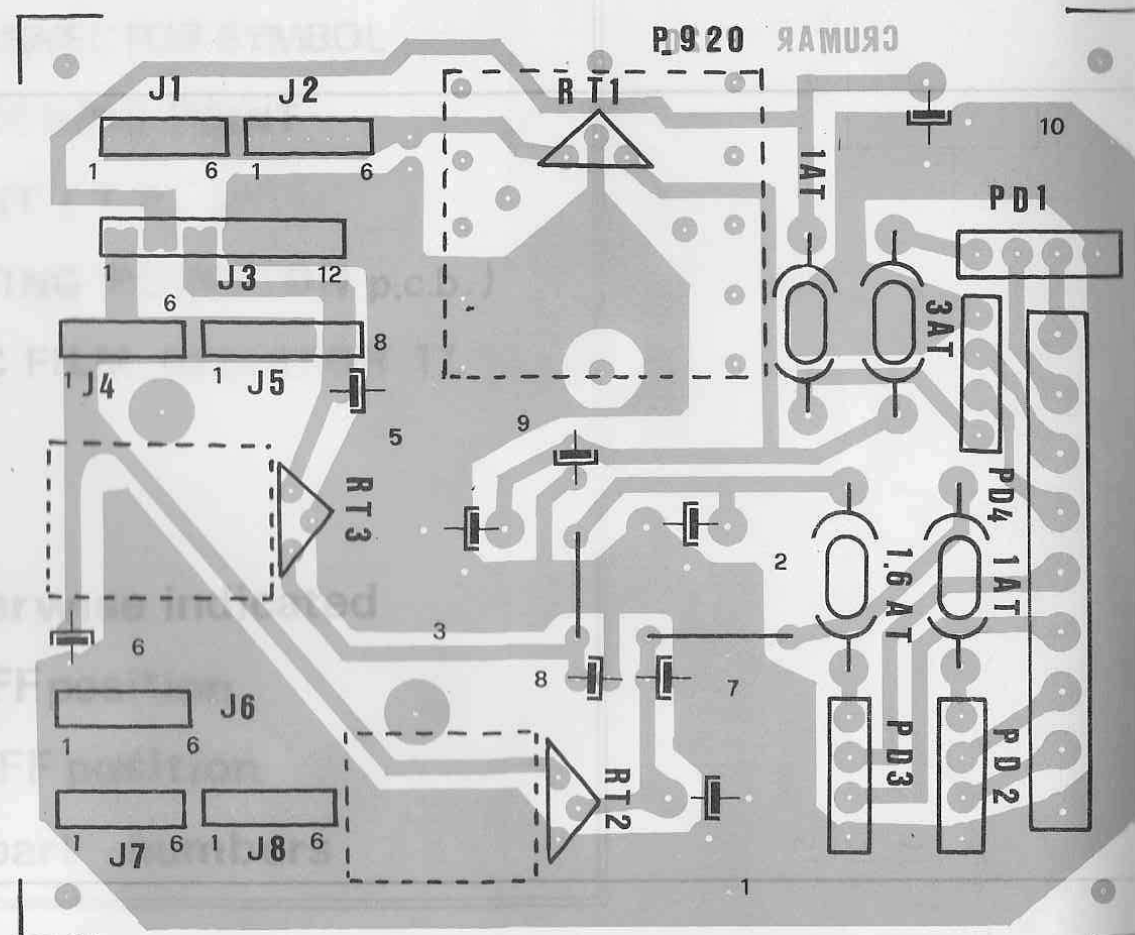
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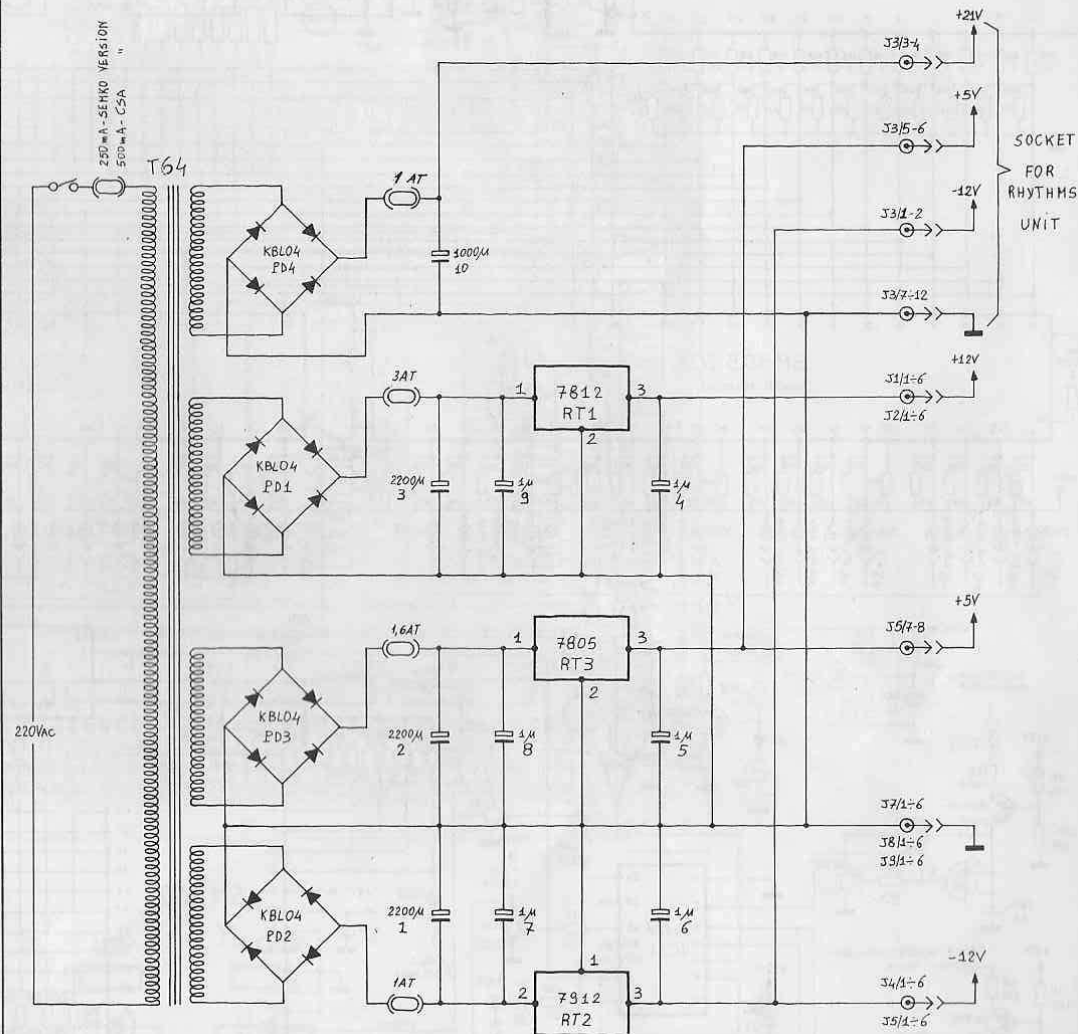
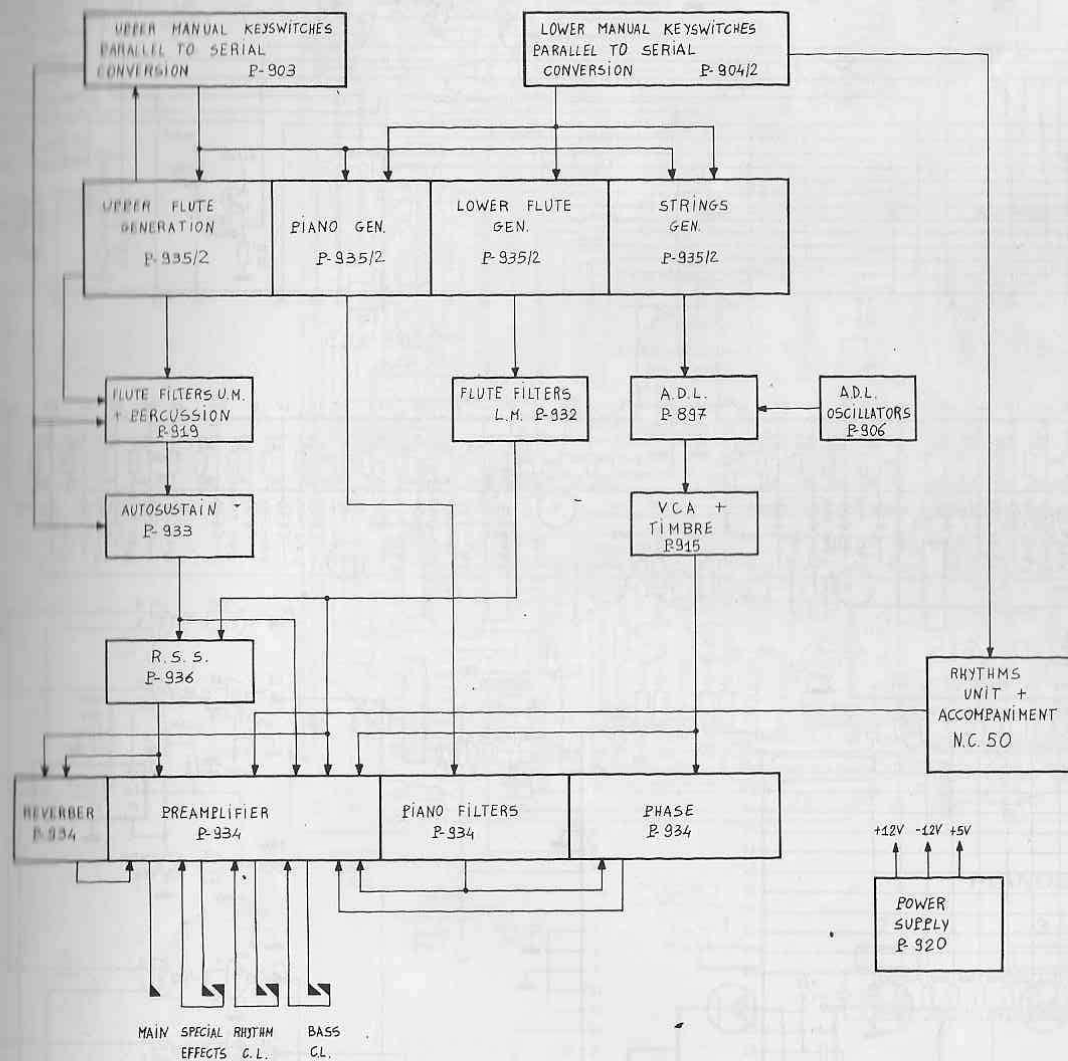
- = POWER SUPPLY
- = FLUTES - PIANO - STRINGS
GENERATION
- = PIANOS SWITCHES
- = POTENTIOMETER BOARD
- = UPPER MANUAL KEYSWITCHES
- = LOWER MANUAL KEYSWITCHES
- = FLUTE FILTERS UPPER MANUAL
- = AUTO SUSTAIN - PRESETS SWITCHES
- = PERCUSSION SWITCHES
- = FLUTE FILTERS LOWER MANUAL
- = FLUTE L.M. - CANCEL UP - LOW
SWITCHES
- = VOLUME CONTROLS
- = AUTO SUSTAIN
- = R.S.S.
- = R.S.S. SWITCHES
- = AUTO SUSTAIN - PRESETS SWITCHES
- = A.D.L. OSCILLATORS
- = DELAY LINES
- = STRINGS SWITCHES
- = VOLUME CONTROLS
- = STRINGS CONTROLS
- = BASS SWITCHES
- = POTENTIOMETER BOARD
- = PEDALBOARD
- = PEDALBOARD KEYSWITCHES
- = FINAL PREAMPLIFIERS
- = PHASE SWITCHES
- = PIANOS SWITCHES
- = VOLUME CONTROLS
- = POTENTIOMETER BOARD



QUESTO DISEGNO È PROPRIETÀ PRIVATA E NON PUÒ ESSERE MOSTRATO A TERZI SENZA NOSTRA APPROVAZIONE SCRITTA.

CRUMAR		MODEL: T3	
DRAWN BY	Bordani G.	REVISION	
DESIGNED BY		DATE	

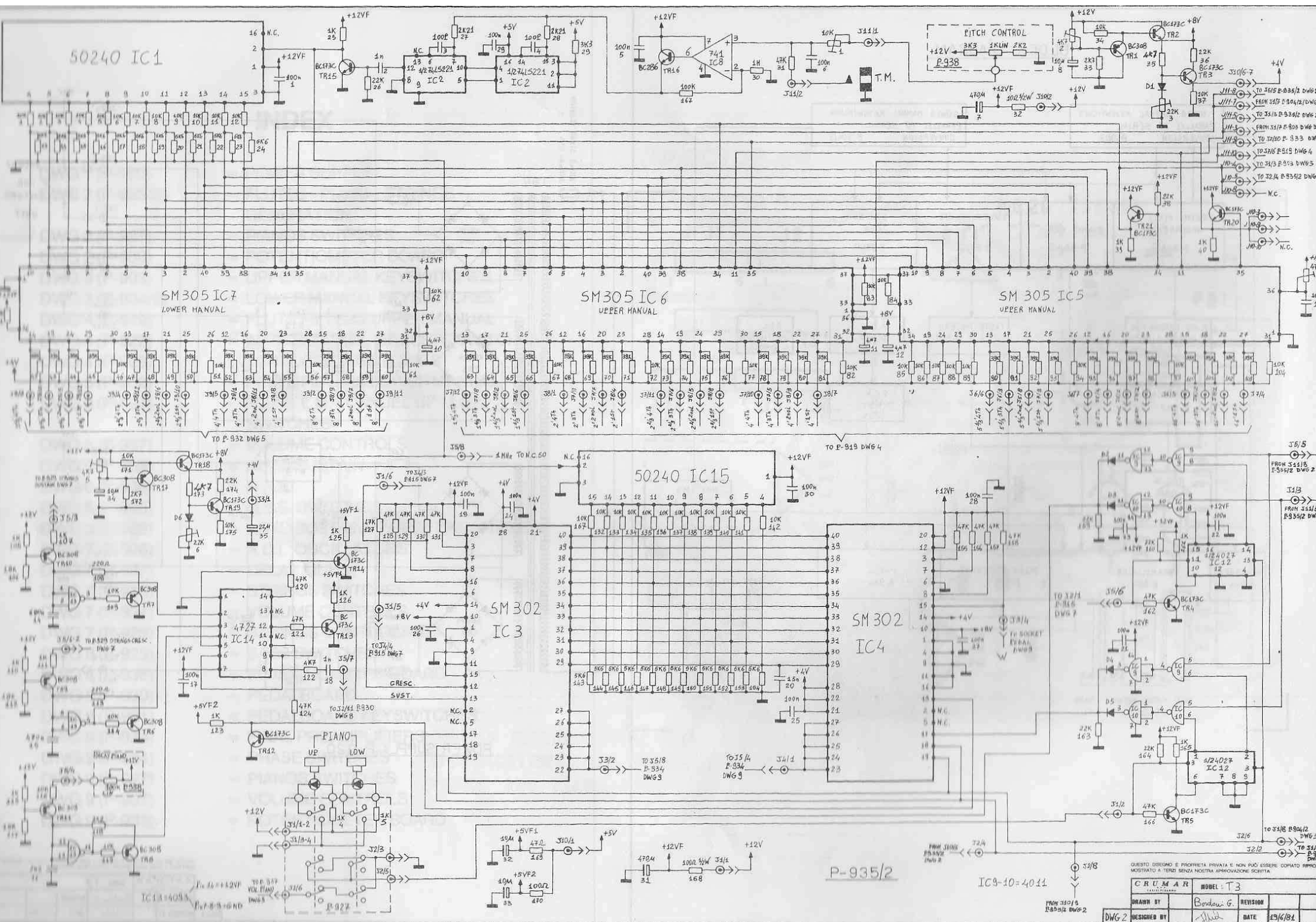
BLOCK DIAGRAM



POWER SUPPLY P-920

QUESTO DISSEGNO È PROPRIETÀ PRIVATA E NON PUÒ ESSERE COPIATO, RIPRODOTTO, MISTO A TERZI SENZA NOSTRA AUTORIZZAZIONE SCRITTA.

CRUMAR		MODEL	T 2
DRAWN BY	REVISION	REVISION	
DESIGNED BY	DATE	12/2/81	



50240 IC1

SM305 IC7
LOWER MANUAL

SM305 IC6
UPPER MANUAL

SM305 IC5
UPPER MANUAL

50240 IC15

SM302
IC3

SM302
IC4

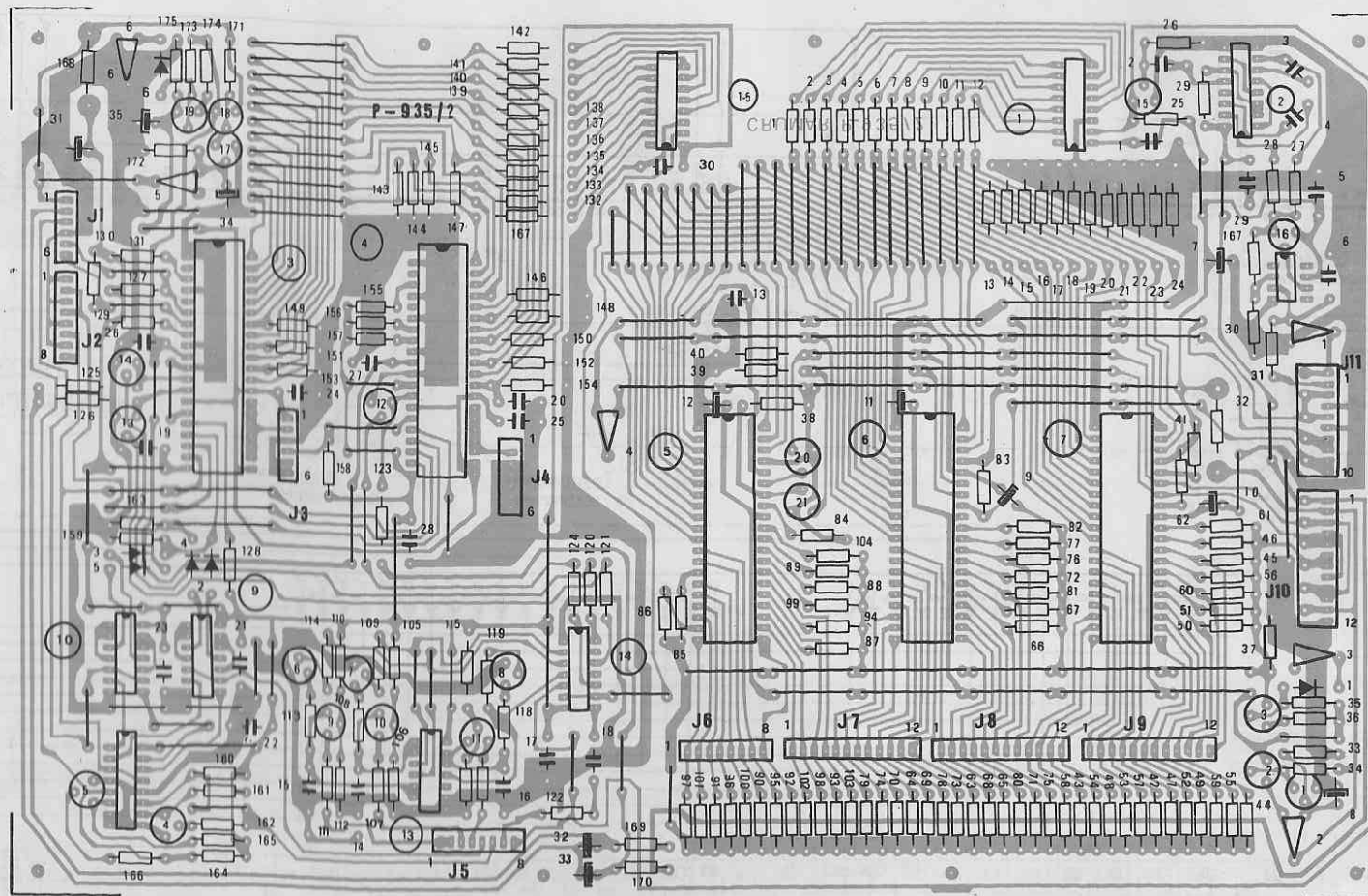
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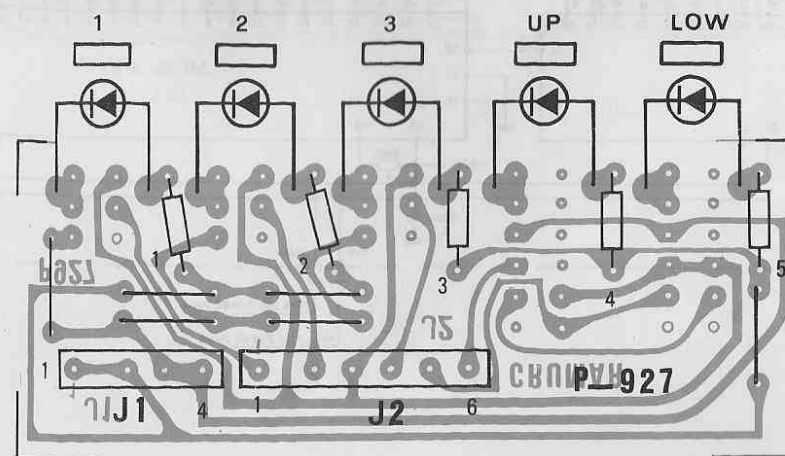
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QUESTO DISSEGNO E PROPRIETA' PRIVATA E NON PUO' ESSERE COPIATO RIPRODOTTO
MODIFICATO A TIRAZI SENZA NOSTRA APPROVAZIONE SCRITTA

CRUMAR	MODEL: T3
DRAWN BY	Bordani G.
DESIGNED BY	...
REVISION	...
DATE	19/6/81



PIANOS

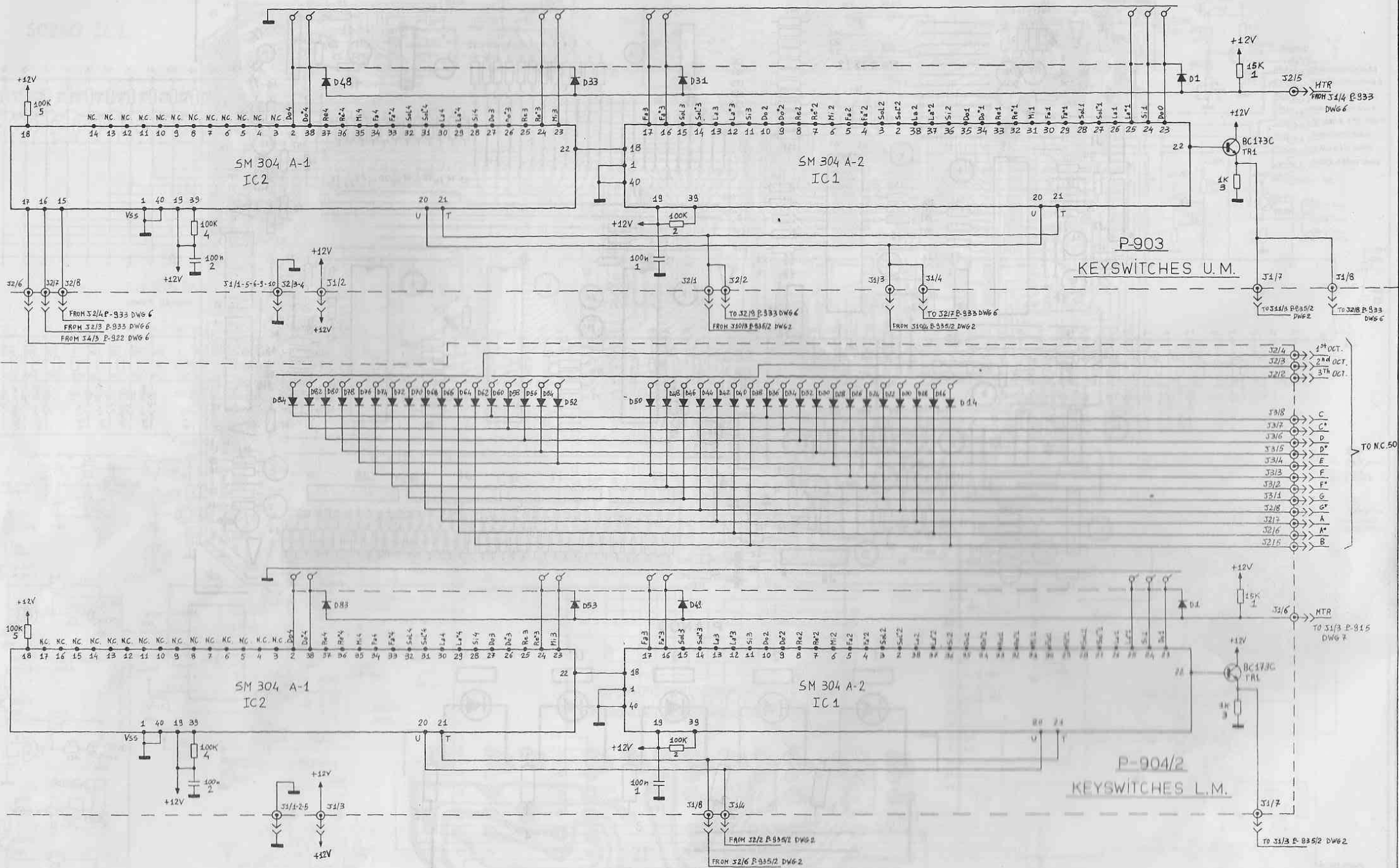


QUESTO DISEGNO È PROPRIETÀ PRIVATA E NON PUÒ ESSERE COPIATO, RIPRODOTTO, MODIFICATO A TERZO SENZA NOSTRA APPROVAZIONE SCRITTA.

CHUMAR MODEL T.3

DESIGNED BY: [Signature] DATE: 1986/03

WAG2A



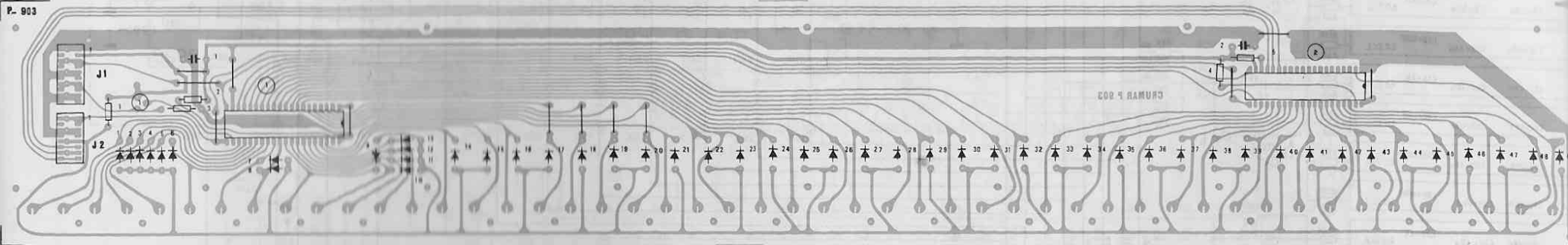
QUESTO DISSEGNO È PROPRIETÀ INVIATA E NON PUÒ ESSERE COPIATO RIPPUBBLICATO
MODIFICATO A TERZO SENZA NOSTRA APPROVAZIONE SCRITTA

CRUMAR MODEL: T3

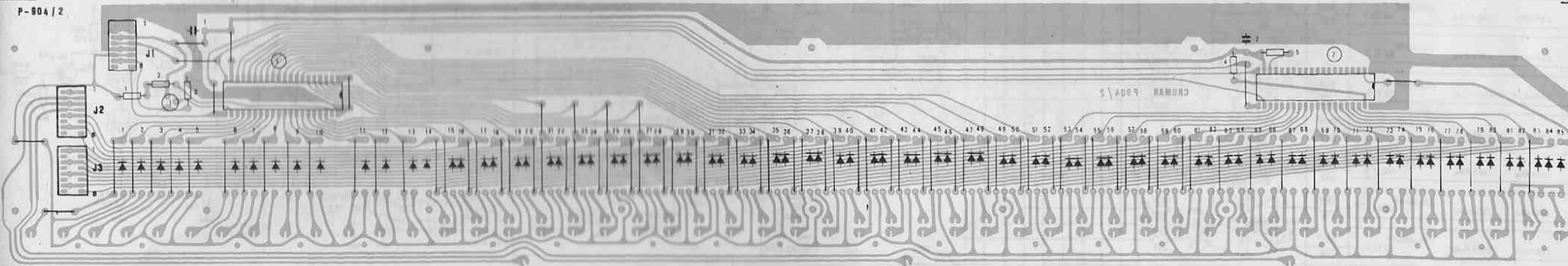
DESIGNED BY: B. G. REVISION: DATE: 19/6/81

DWG. 3 DESIGNED BY: DATE: 19/6/81

P-903

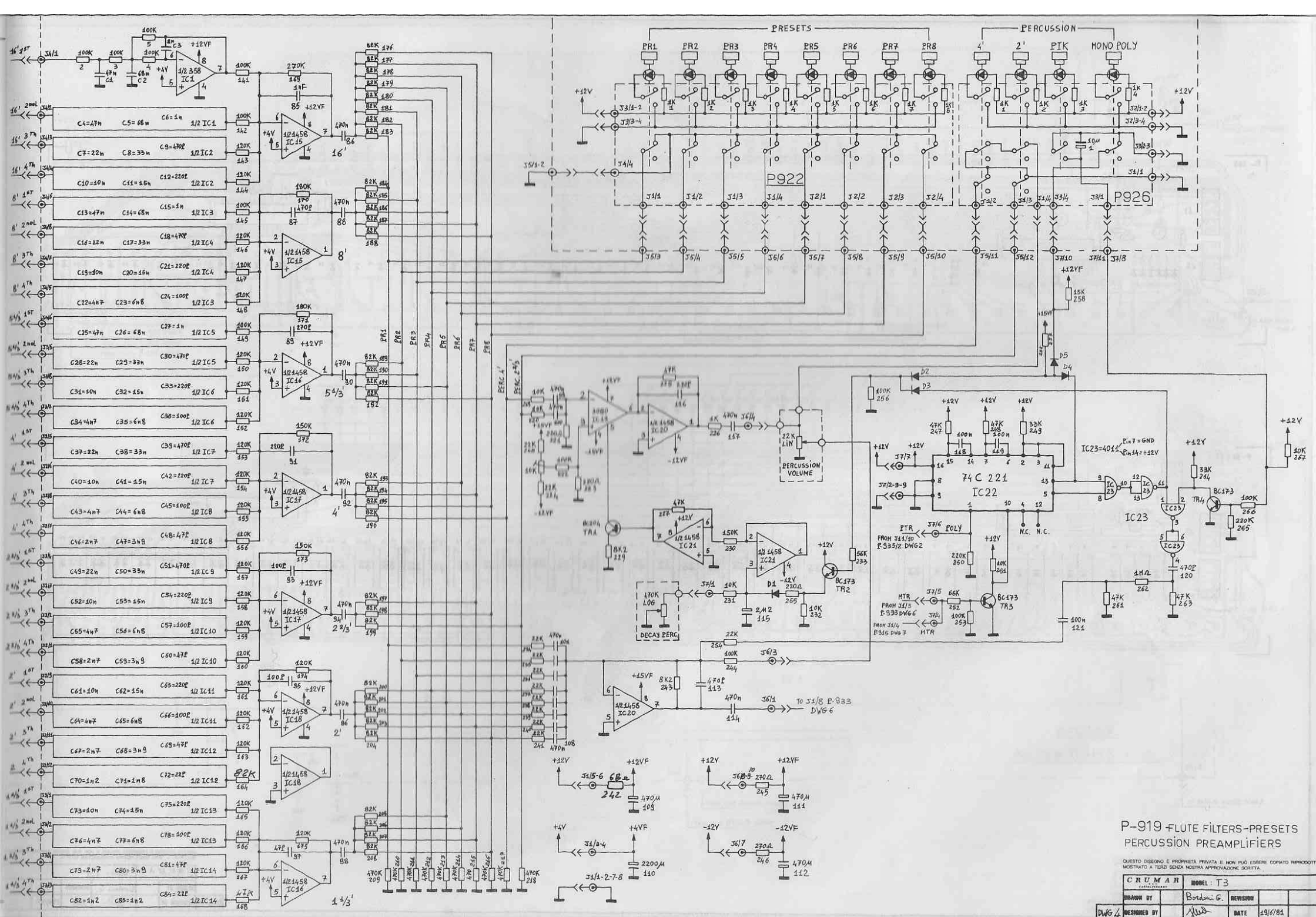


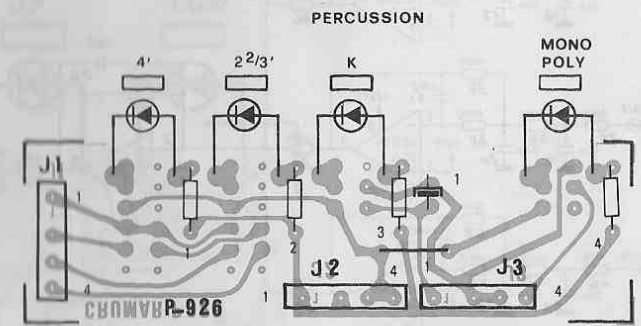
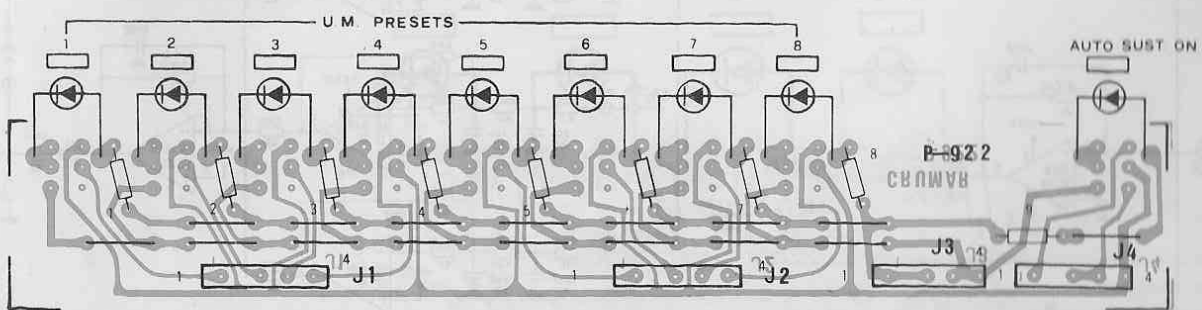
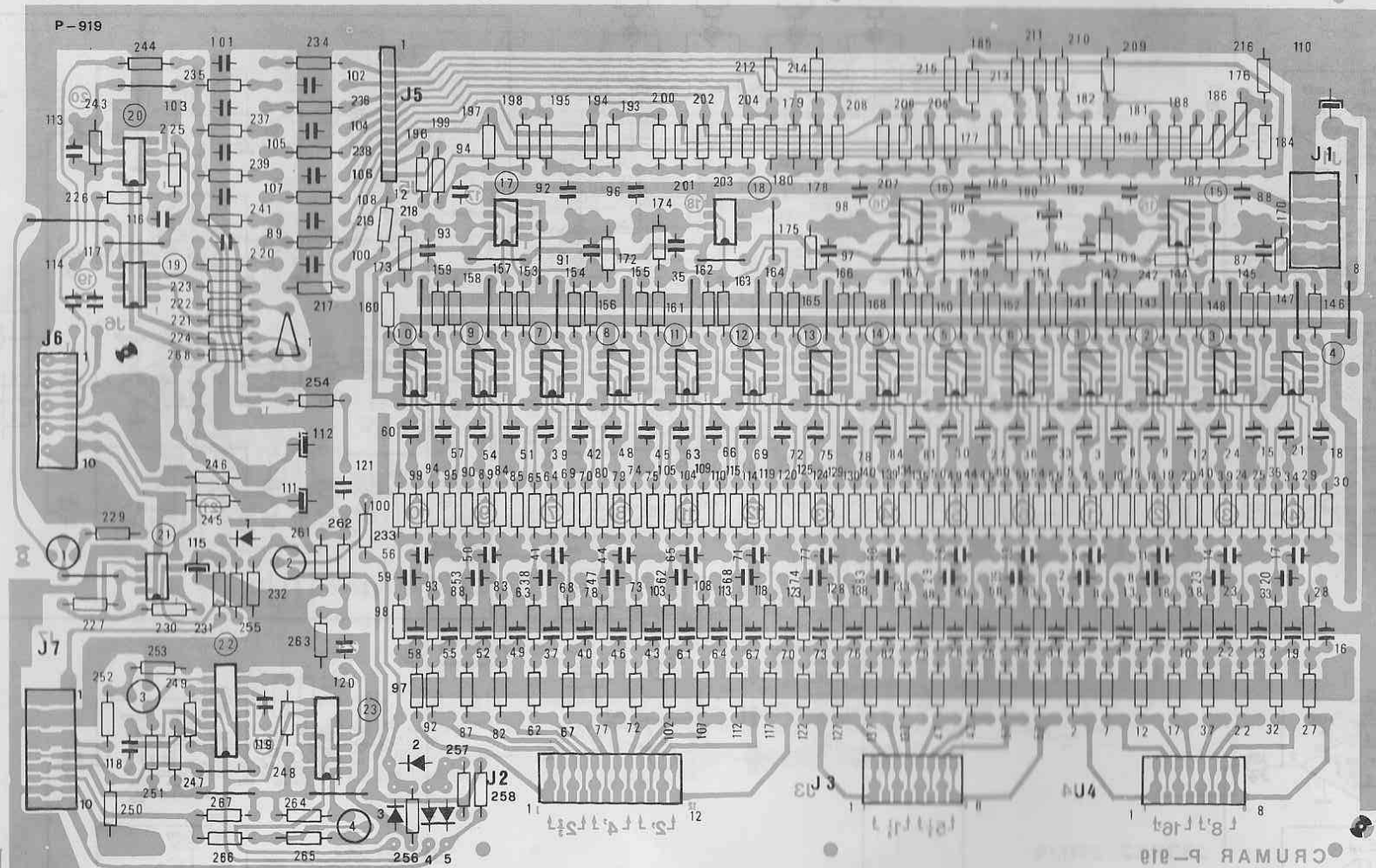
P-904 / 2



QUESTO DISEGNO È PROPRIETÀ PRIVATA E NON PUÒ ESSERE COPIATO
MOSTRATO A TERZI SENZA NOSTRA APPROVAZIONE SCRITTA.

CRUMAR		MODEL: T3
DRAWN BY	Bonanni G.	REVISION
DWG 3A	DESIGNED BY	DATE

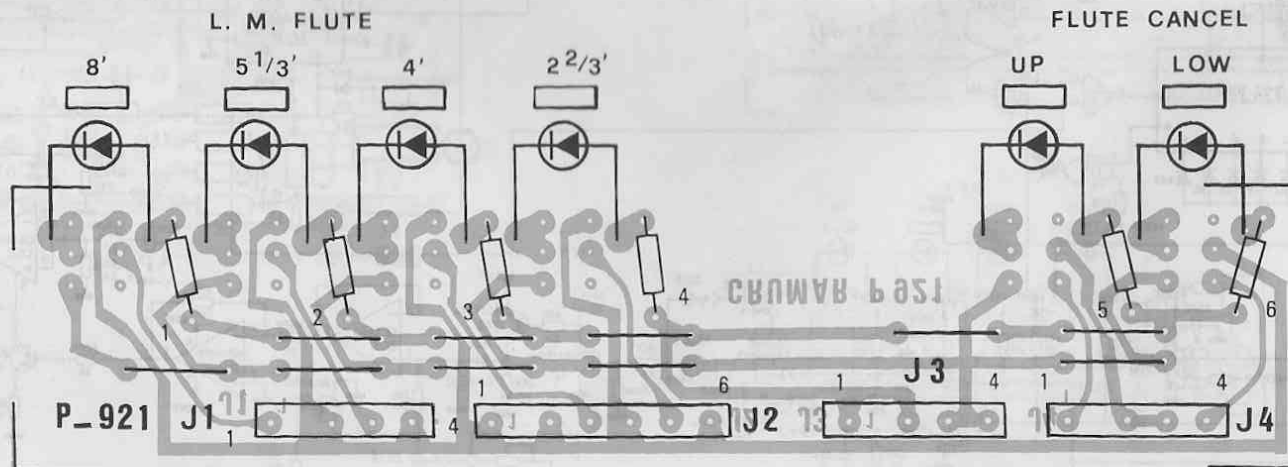
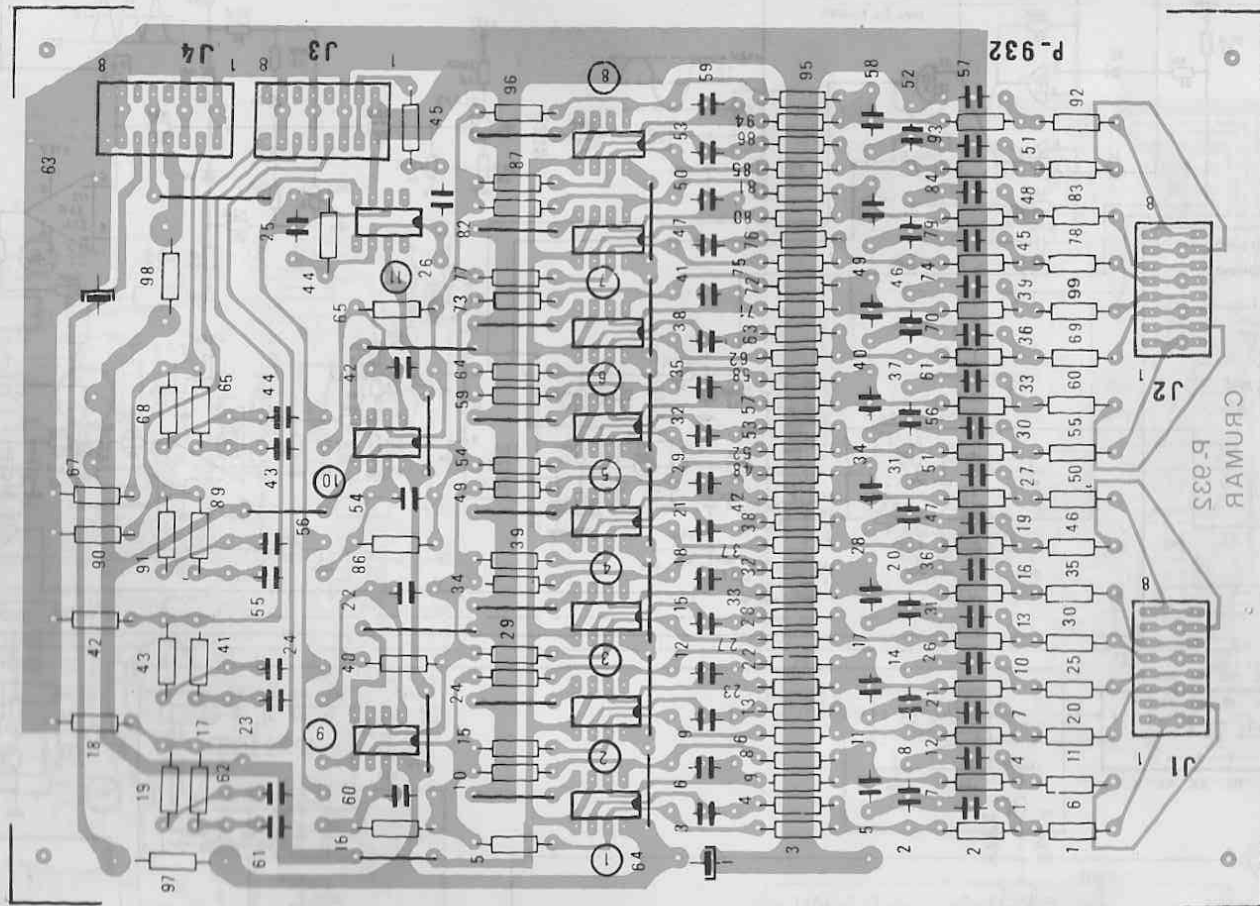




QUESTO DISEGNO È PROPRIETÀ PRIVATA E NON PUÒ ESSERE COPIATO, RIPRODOTTO, MOSTRATO A TERZI SENZA NOSTRA APPROVAZIONE SCRITTA.

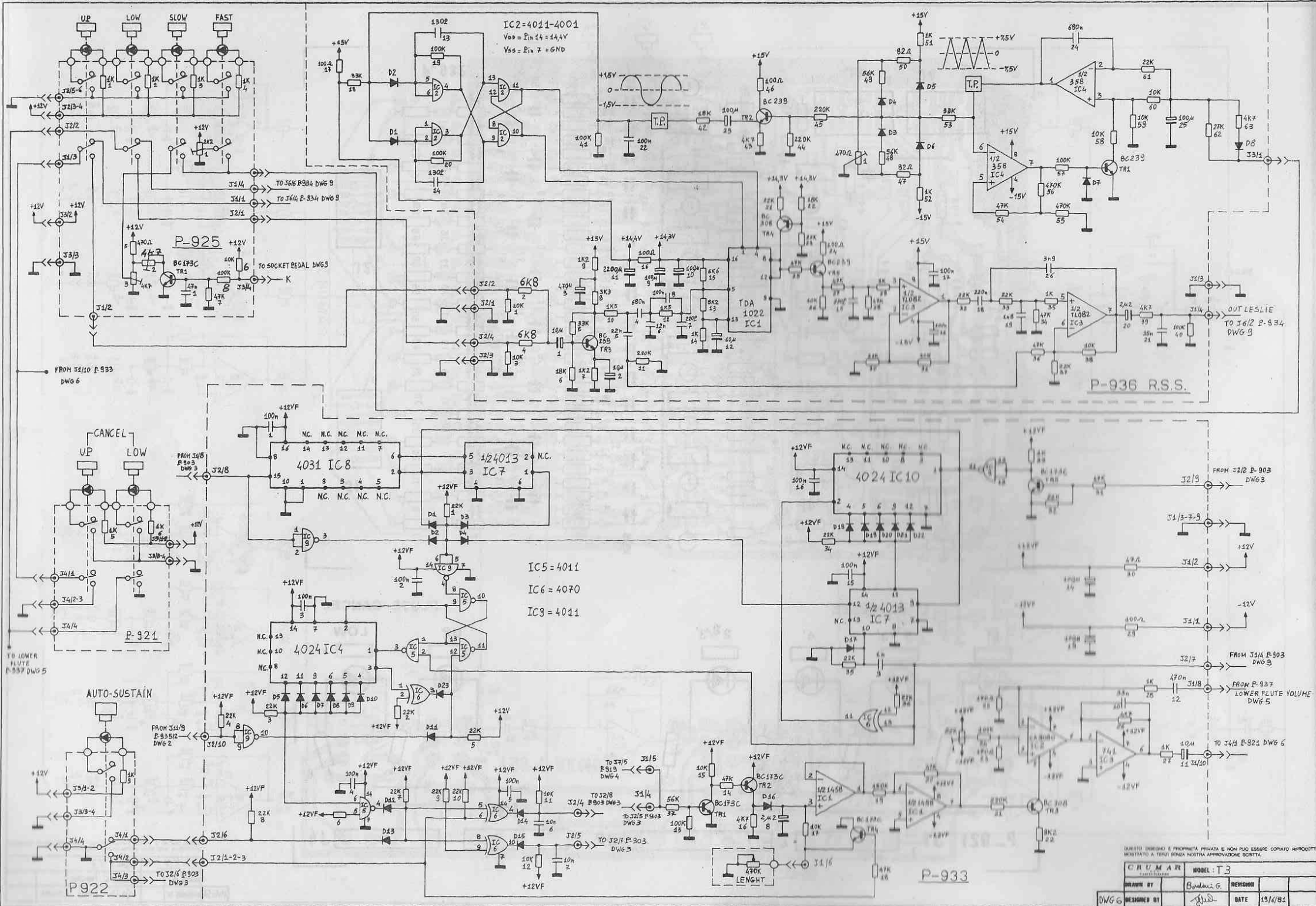
CRUMAR		MODEL: T3	
DRAWN BY	Bordani G.	REVISION	
DESIGNED BY	...	DATE	12/4/84

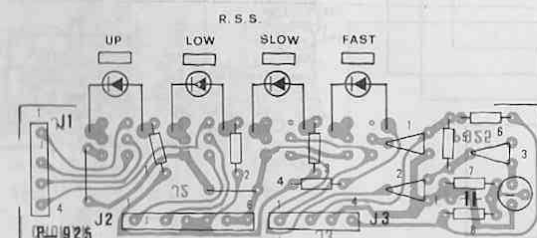
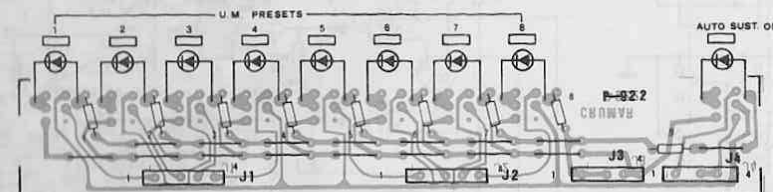
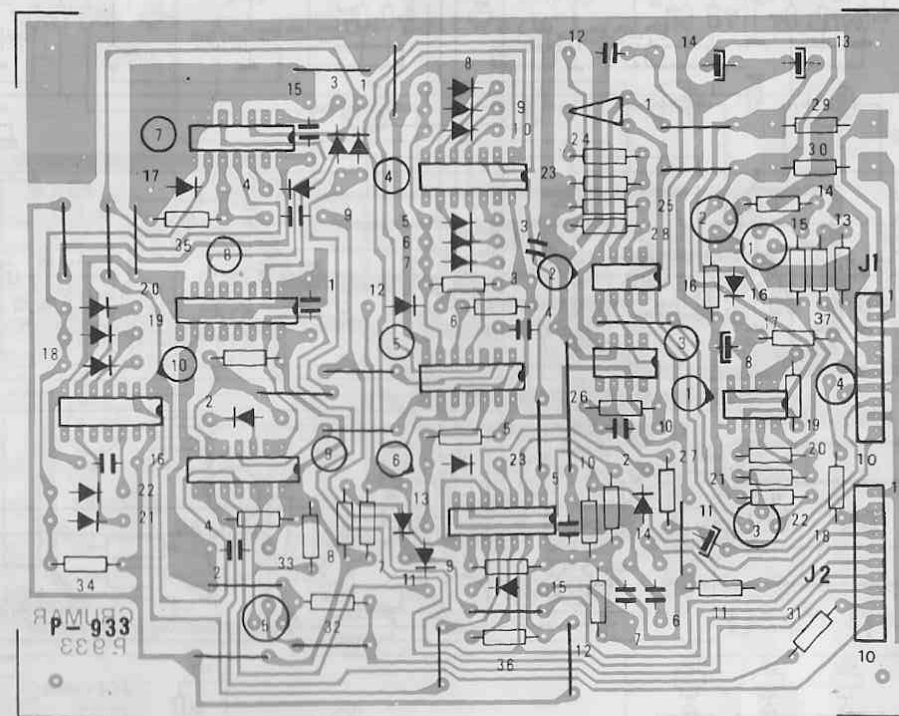
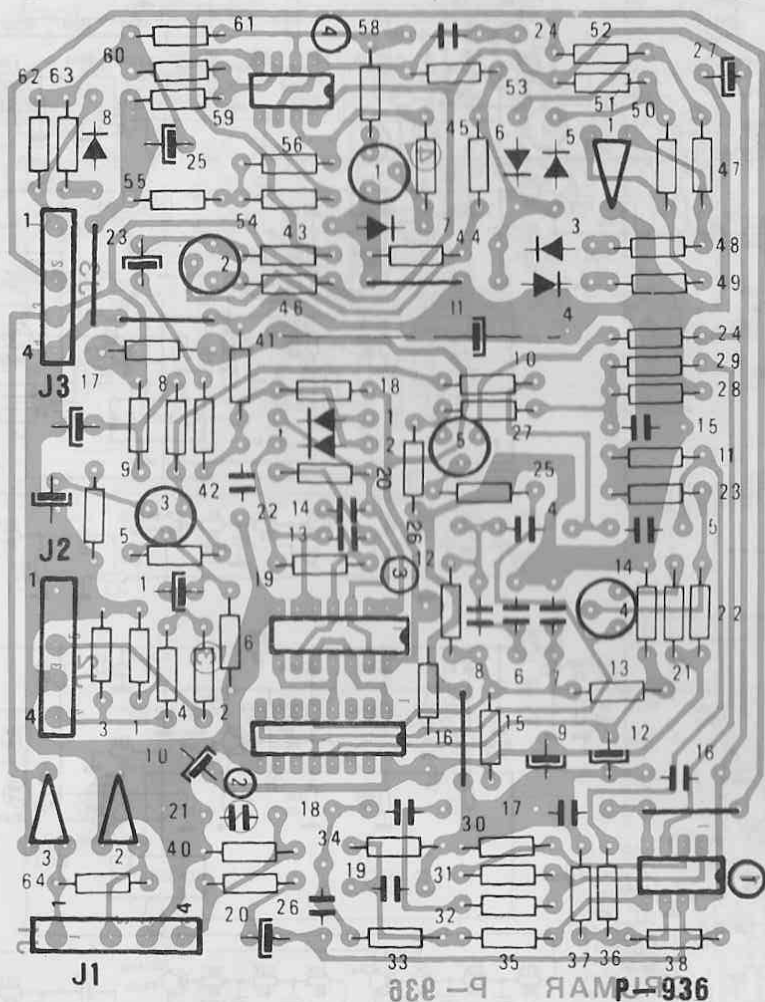
DWG 4A



CRUMAR MODEL: T3

DESIGNED BY	REVISION	DATE
DW55A	Bordani G.	1/16/61



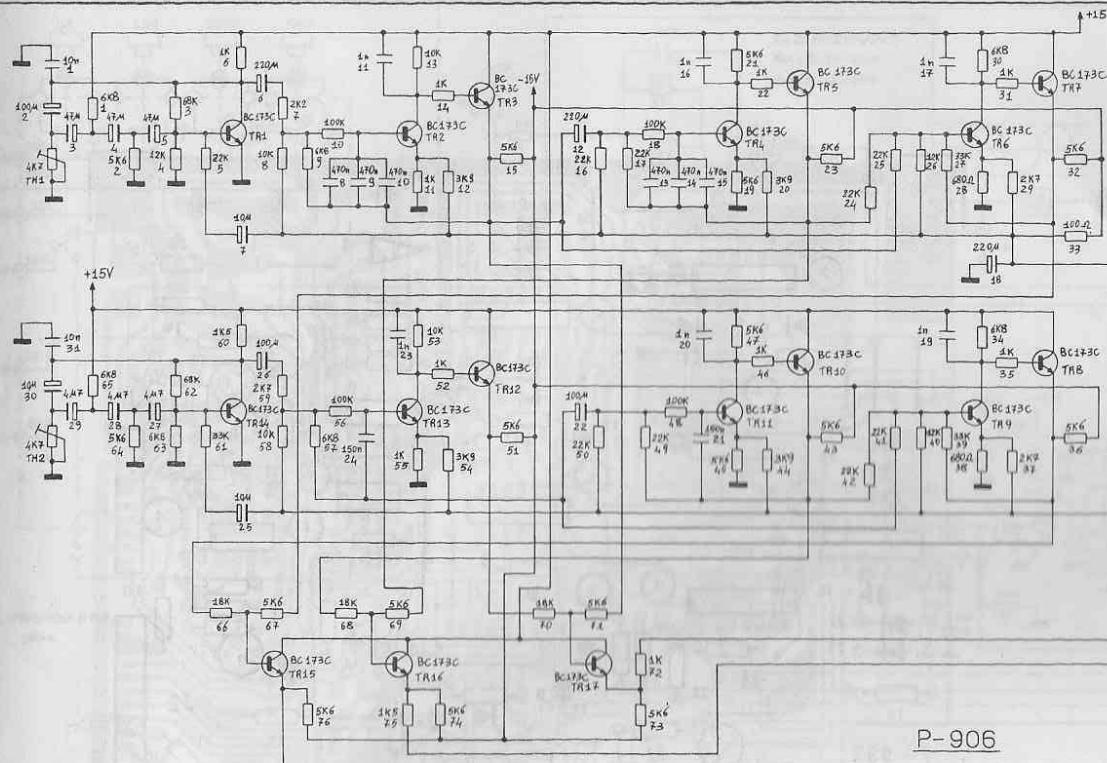


QUESTO DISEGNO È PROPRIETÀ PRIVATA E NON PUÒ ESSERE COPIATO, RIPRODOTTO, MOSTRATO A TERZI, SENZA NOSTRA APPROVAZIONE SCRITTA.

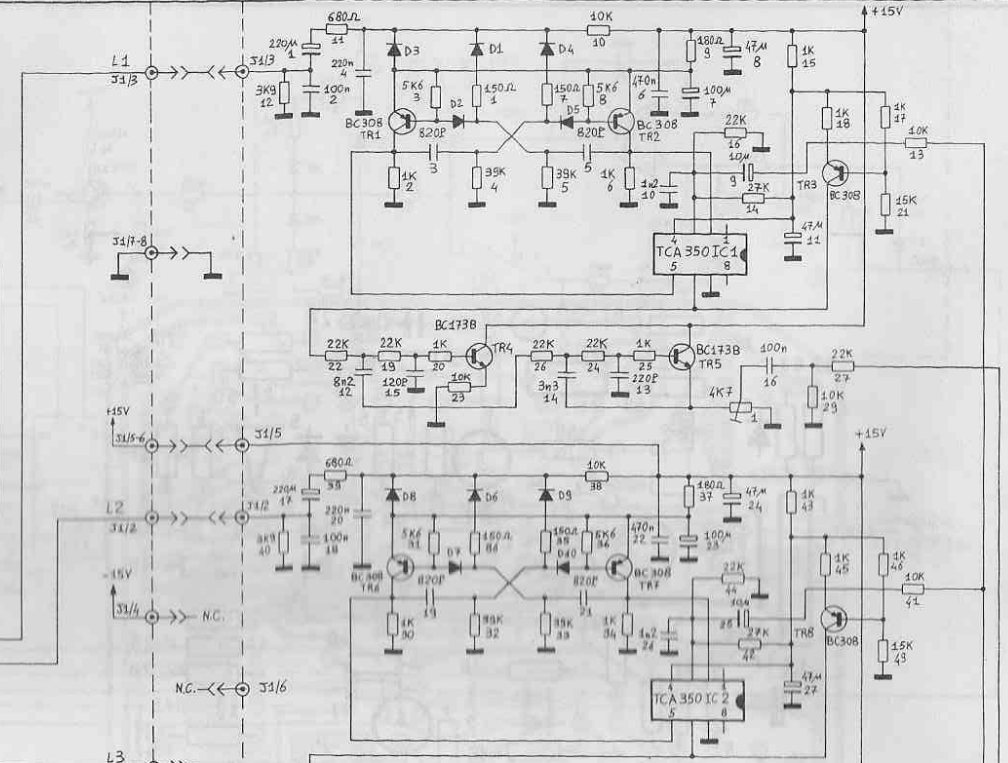
CRUMAR MODEL T3

DRAWN BY Bordin G. REVISION

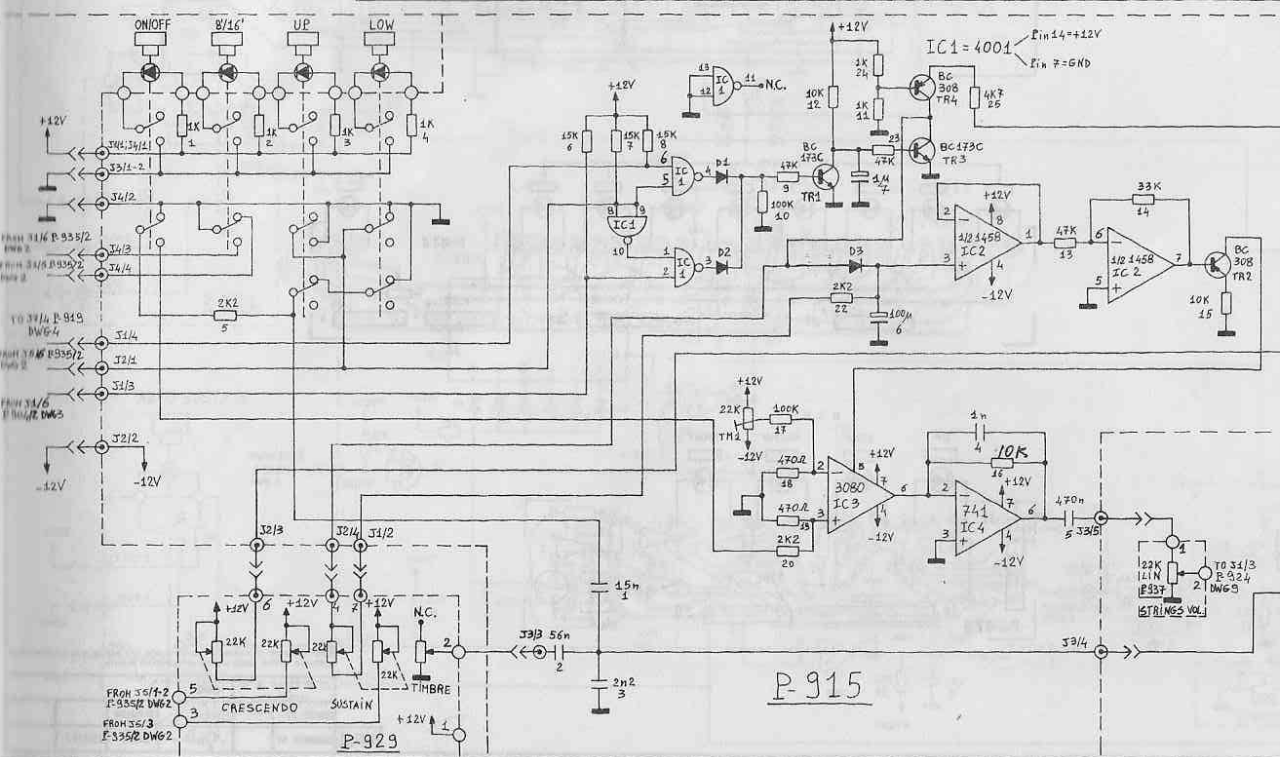
DESIGNED BY DATE 25/6/81



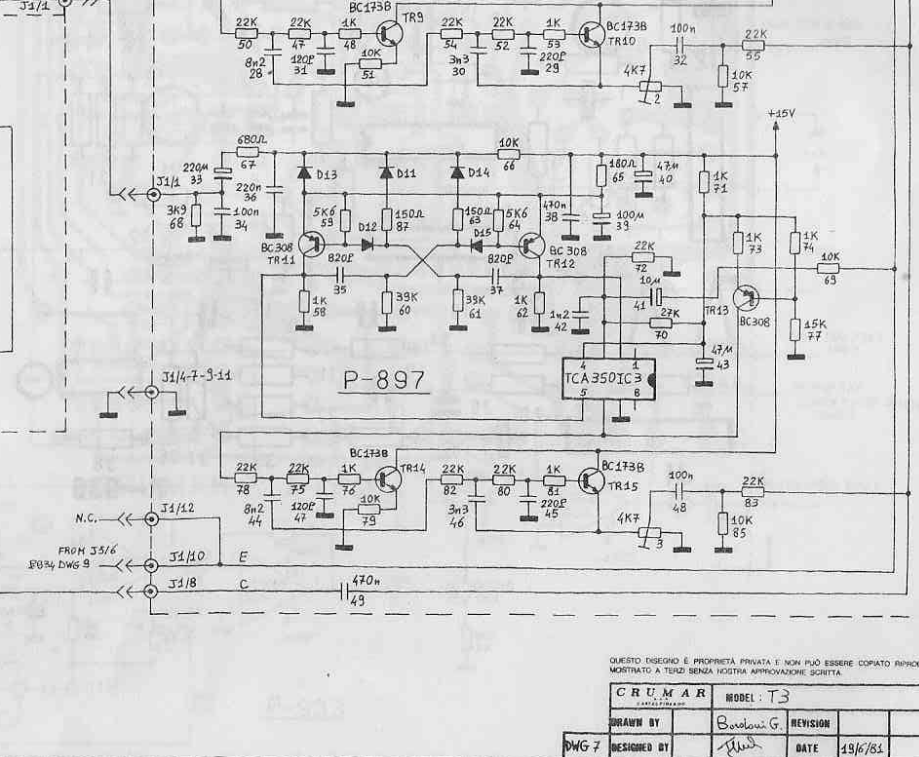
P-906



P-897



P-915

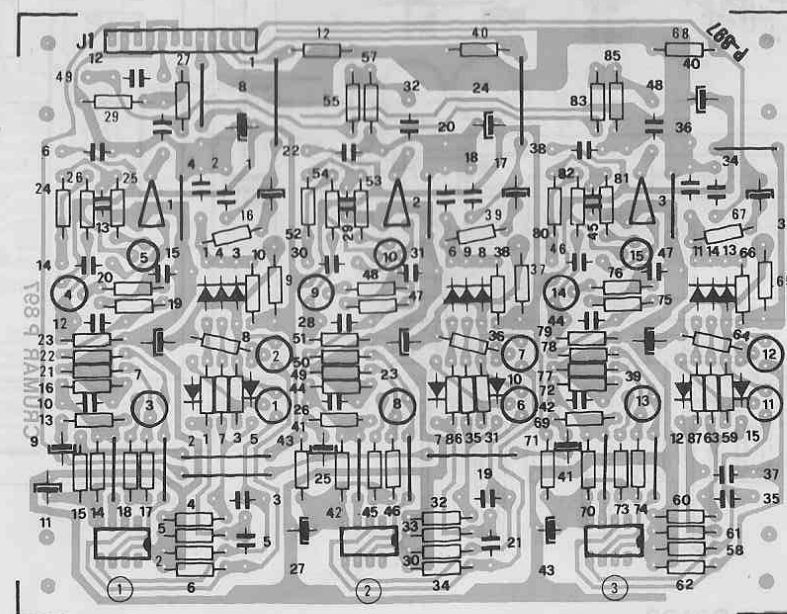
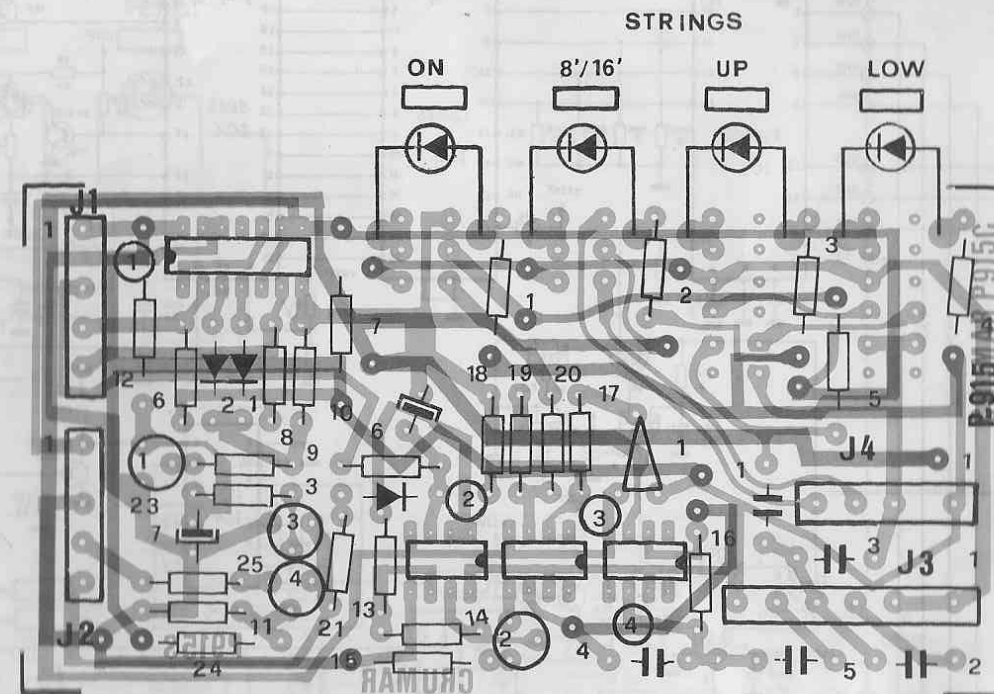
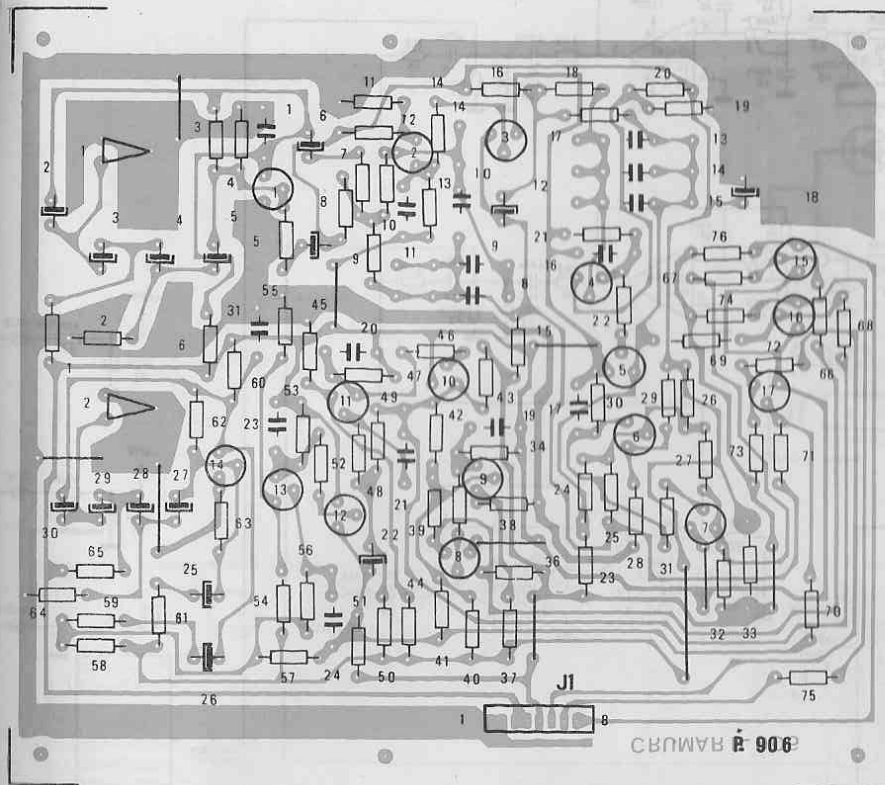


P-929

QUESTO DISEGNO È PROPRIETÀ PRIVATA E NON PUÒ ESSERE COPIATO RIPPUBBLICATO
MORTUATO A TERZI SENZA NOSTRA APPROVAZIONE SCRITTA

CRUMAR		MODEL: T3	
DRAWN BY	Bardani G.	REVISION	
DESIGNED BY		DATE	19/6/81

DWG 7



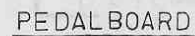
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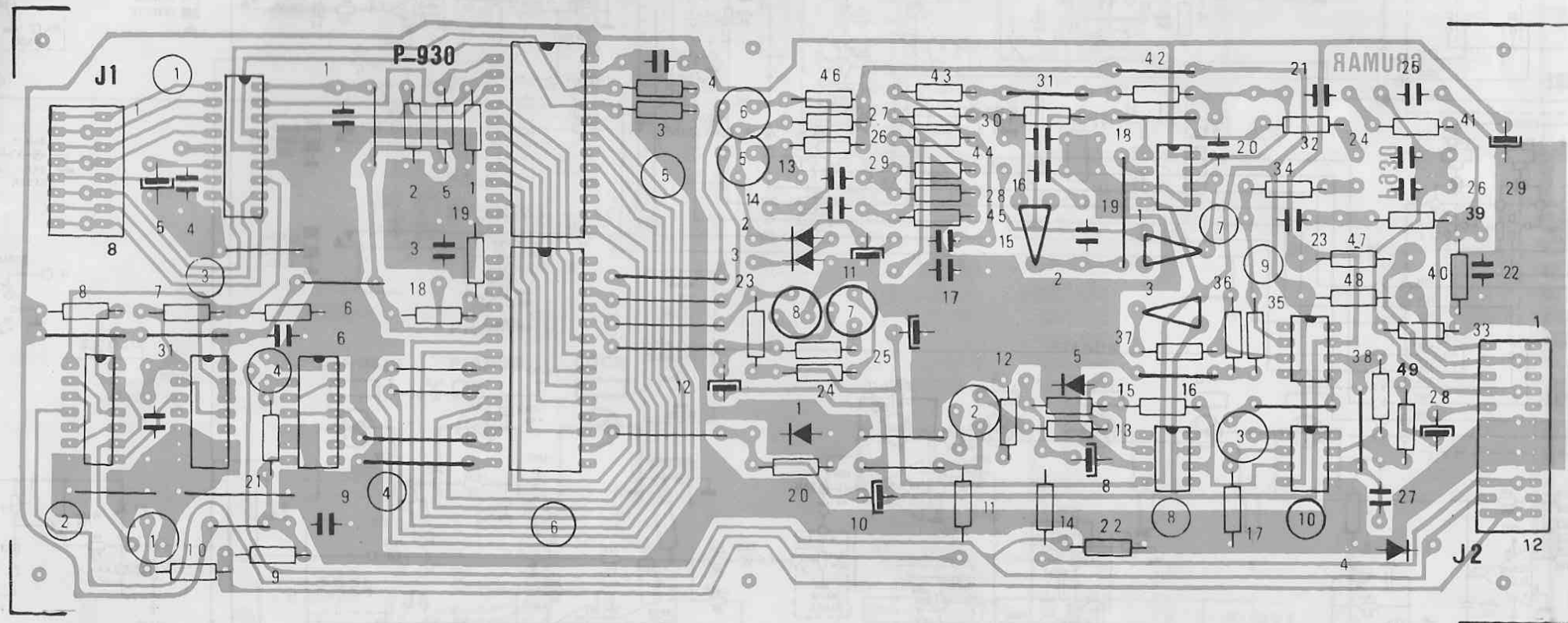
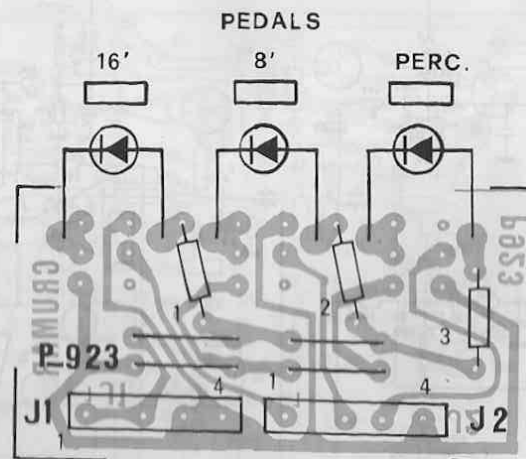
CHUMAR MODEL 13

DRAWN BY: [Signature] REVISION

DESIGNED BY: [Signature] DATE: 10/01

DWG 7A



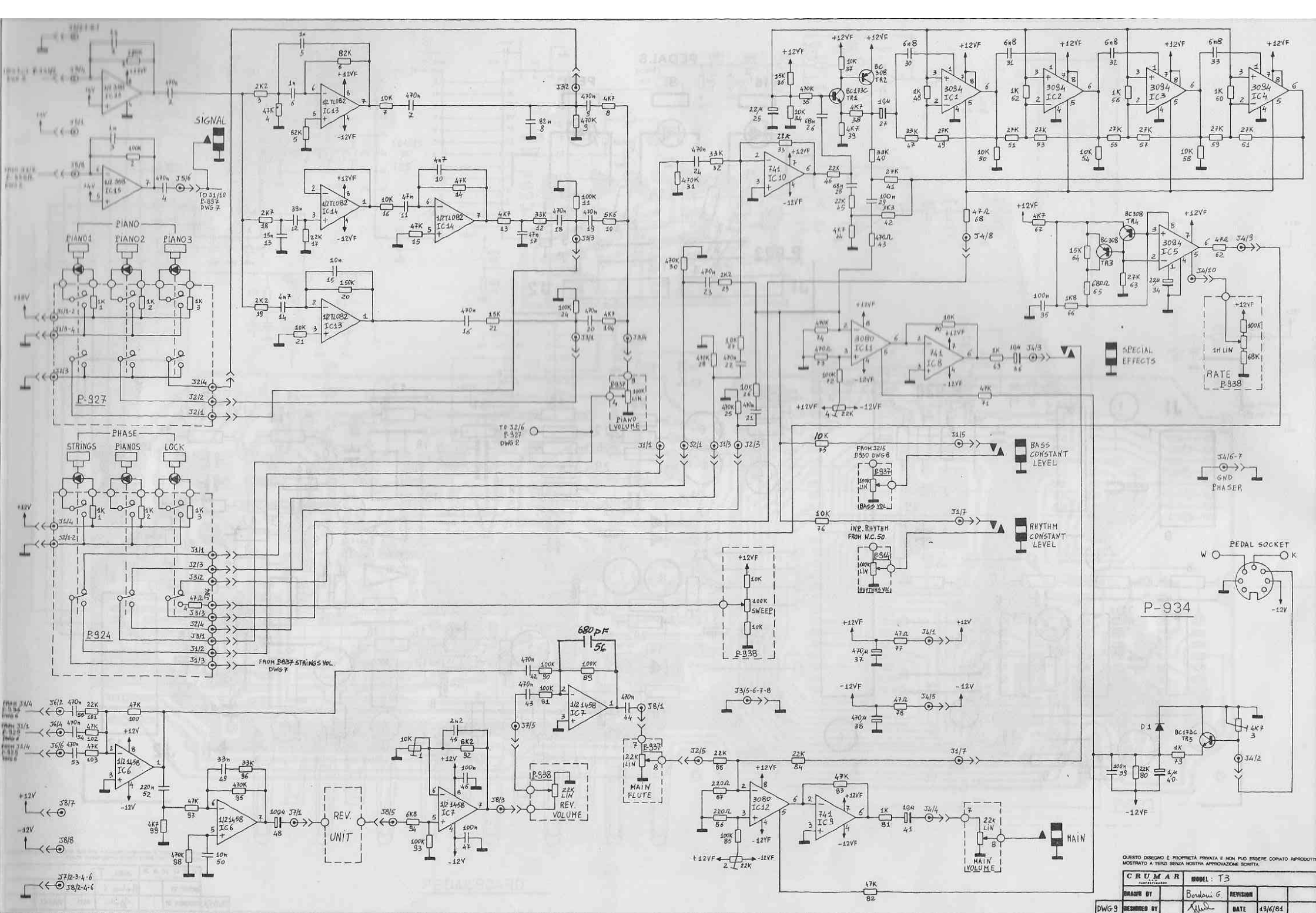


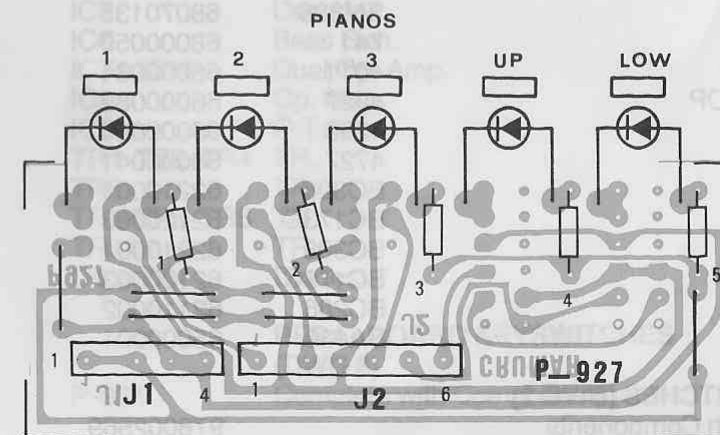
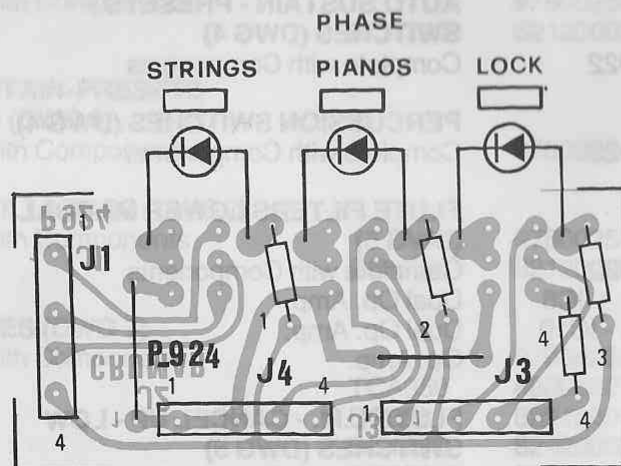
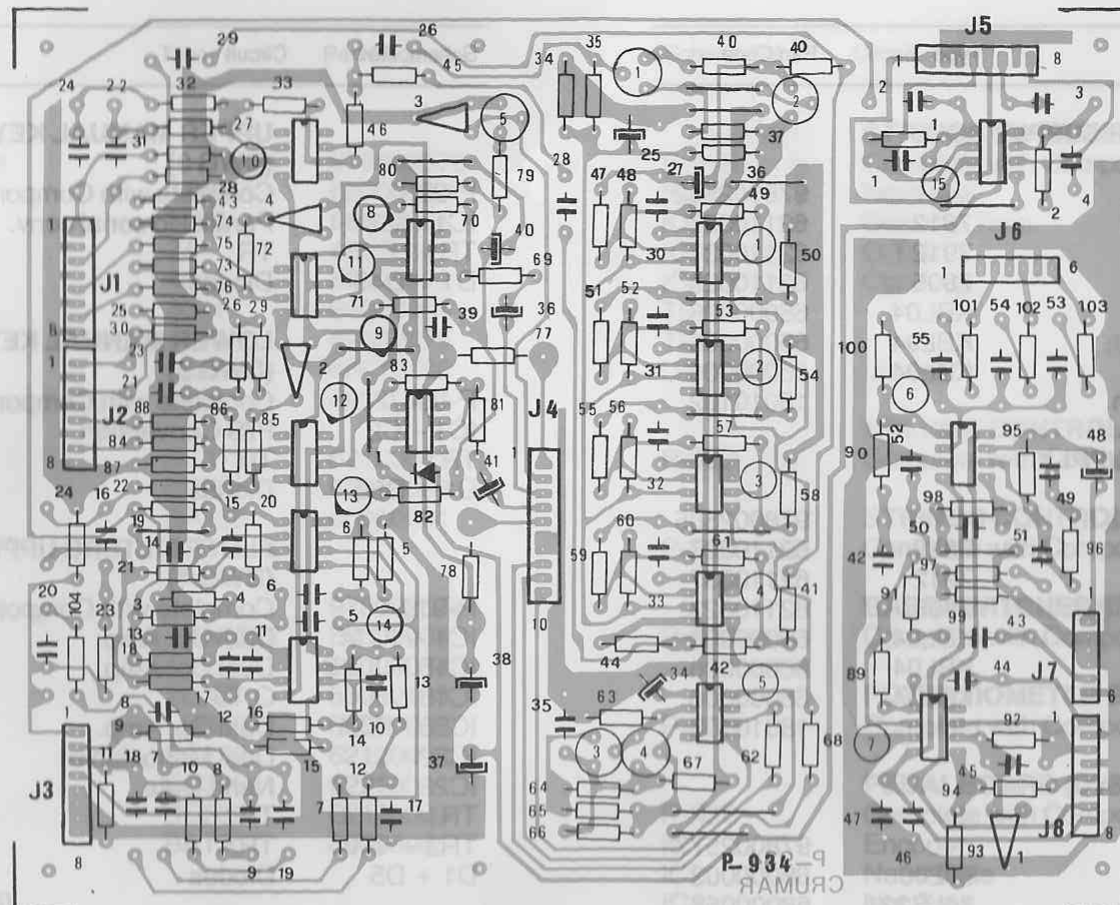
QUESTO DISEGNO È PROPRIETÀ PRIVATA E NON PUÒ ESSERE RIPRODOTTO, COPIATO, VENDUTO, O IN ALTRIMODO MOSTRATO A TERZI SENZA NOSTRA APPROVAZIONE SCRITTA.

CRUMAR MODEL 73

DRAWN BY G. B. DESIGNED BY G. B. DATE 1/10/73

DWG 66A





QUESTO DISSEGNO È PROPRIETÀ PRIVATA E NON PUÒ ESSERE RIPRODOTTO, RISTAMPATO O UTILIZZATO IN ALCUN MODO SENZA L'APPROVAZIONE SCRITTA.

CRUMAR		MODEL T.1	
DRAWN BY	Barbieri G.	REVISION	
DESIGNED BY		DATE	10/6/74

MODEL T3

ELECTRONIC COMPONENT LIST

Schem. Ref.	Circuit	Type	Part Code
SEMKO VERSION - POWER SUPPLY (DWG 1)			
P-920	Complete with Components		978002562
RT1	Voltage Regulator	7812	62110027
RT2	Voltage Regulator	7912	62110037
RT3	Voltage Regulator	7805	62110023
PD1	Rectifier Bridge	KBL04	66000006
PD2	Rectifier Bridge	KBL04	66000006
PD3	Rectifier Bridge	KBL04	66000006
T64	Transformer SEMKO Version		18010102
CSA VERSION - POWER SUPPLY (DWG 1)			
P-920	Complete with Components		978002585
RT1	Voltage Regulator	7812	62110027
RT2	Voltage Regulator	7912	62110037
RT3	Voltage Regulator	7805	62110023
PD1	Rectifier Bridge	KBL04	66000006
PD2	Rectifier Bridge	KBL04	66000006
PD3	Rectifier Bridge	KBL04	66000006
T64	Transformer CSA Version		18010103
FLUTES - PIANO - STRINGS GENERATION (DWG 2)			
P-935/2	Complete with Components		978002577
IC1 - IC15	T.O.S.	50240	68000009
IC2	Master Oscillator	74LS221	68000058
IC3 - IC4	Strings - Piano - Gen.	SM302	68070165
IC5 ÷ IC7	Flutes Gen.	SM305	68070135
IC8	Op. Amp.	741	68000059
IC9 - IC10	NAND GATE	4011	68000034
IC12	J-K FLIP-FLOP	4027	68000089
IC13	Trigger	4093	68000050
IC14	Divider	4727	68000041
TR1 - TR17	TR.	BC308	62210001
TR2 ÷ TR5	TR.	BC173C	62120003
TR6 ÷ TR11	TR.	BC308	62210001
TR12 ÷ TR15	TR.	BC173C	62120003
TR16	TR.	BC286	62110002
D1 ÷ D6	Diodes	BA130	65000001
P-927	PIANOS SWITCHES (DWG 2) Complete with Components		978002569
P-938	POTENTIOMETER BOARD (DWG 2) Complete with Components		978002581

MODEL T3

ELECTRONIC COMPONENT LIST

Schem. Ref.	Circuit	Type	Part Code
UPPER MANUAL KEYSWITCHES (DWG 3)			
P-903	Complete with Components		978002545
IC1 - IC2	Parallel to serial conv.	SM304A	68070134
TR1	TR	BC173C	62120003
D1 ÷ D49	Diodes	BA130	65000001
LOWER MANUAL KEYSWITCHES (DWG 3)			
P-904/2	Complete with Components		978002546
IC1 - IC2	P/S Conversion	SM304A	68070134
TR1	TR	BC173C	62120003
D1 ÷ D85	Diodes	BA130	65000001
FLUTE FILTERS UPPER MANUAL (DWG 4)			
P-919	Complete with Components		978002561
IC1 ÷ IC14	Dual Op. Amp.	LM358	68030174
IC15 ÷ IC18	Dual Op. Amp.	1458	68000053
IC19	O.T.A.	3080	68000066
IC20 - IC21	Dual Op. Amp.	1458	68000053
IC22	Dual Monostable	74C221	68000099
IC23	Nand Gate	4011	68000034
TR1	TR.	BC308	62210001
TR2 ÷ TR4	TR.	BC173C	62120003
D1 ÷ D5	Diodes	BA130	65000001
AUTO SUSTAIN - PRESETS SWITCHES (DWG 4)			
P-922	Complete with Components		978002564
P-926	PERCUSSION SWITCHES (DWG 4) Complete with Components		978002568
FLUTE FILTERS LOWER MANUAL (DWG 5)			
P-932	Complete with Components		978002574
IC1 ÷ IC8	Dual Op. Amp.	LM358	68030174
IC9 - IC10	Dual Op. Amp.	1458	68000053
IC11	Op. Amp.	741	68030141
P-921	FLUTE L.M. - CANCEL UP - LOW SWITCHES (DWG 5) Complete with Components		978002563
P-937	VOLUME CONTROLS (DWG 5) Complete with Components		978002580

MODEL T3

ELECTRONIC COMPONENT LIST

Schem. Ref.	Circuit	Type	Part Code
AUTO-SUSTAIN (DWG 6)			
P-933	Complete with Components		978002575
IC1	Dual Op. Amp.	1458	68000053
IC2	O.T.A.	3080	68000066
IC3	Op. Amp.	741	68030141
IC4 - IC10	Binary Counter	4024	68010122
IC5 - IC9	Nand Gate	4011	68000034
IC6	Exclusive Or	4070	68000070
IC7	D Flip-Flop	4013	68010136
IC8	Static Shift Register	4031	68010164
TR1-TR2- TR4-TR5		BC173C	62120003
TR3		BC308	62210001
D1 ÷ D23	Diodes	BA130	65000001
R.S.S. (DWG 6)			
P-936	Complete with Components		978002578
IC1	ADL	TDA1022	68000084
IC2	Nand Gate	4011	68000034
IC3	Dual Op. Amp.	TL082	68030163
IC4	Dual Op. Amp.	LM358	68000093
TR1 ÷ TR3	TR	BC239	62120003
TR4	TR	BC308	62210001
TR5	TR	BC239	62120003
D1 ÷ D8	Diodes	BA130	65000001
R.S.S. SWITCHES (DWG 6)			
P-925	Complete with Components		978002567
TR1	TR.	BC173C	62120003
AUTO-SUSTAIN-PRESETS SWITCHES (DWG 6)			
P-922	Complete with Components		978002564
A.D.L. OSCILLATORS (DWG 7)			
P-906	Complete with Components		978002548
TR1 ÷ TR17	TR.	BC173C	62120003
DELAY LINES (DWG 7)			
P-897	Complete with Components		978002586
IC1 + IC3	A.D.L.	TCA350	68000007
TR1 + TR3	TR.	BC308	62210001
TR4 - TR5	TR.	BC173C	62120003
TR6 ÷ TR8	TR.	BC308	62210001
TR9 - TR10	TR.	BC173C	62120003
TR11 ÷ TR13	TR.	BC308	62210001
TR14 - TR15	TR.	BC173C	62120003
D1 ÷ D15	Diodes	BA130	65000001

MODEL T3

ELECTRONIC COMPONENT LIST

Schem. Ref.	Circuit	Type	Part Code
STRINGS SWITCHES (DWG 7)			
P-915	Complete with Components		978002557
IC1	Nor Gate	4001	68000020
IC2	Dual Op. Amp.	1458	68000053
IC3	O.T.A.	3080	68000066
IC4	Op. Amp.	741	68000059
TR1		BC173C	62120003
TR2		BC308	62210001
D1 ÷ D3	Diodes	BA130	65000001
VOLUME CONTROLS (DWG 7)			
P-937	Complete with Components		978002580
STRINGS CONTROLS (DWG 7)			
P-929	Complete with Components		978002571
BASS SWITCHES (DWG 8)			
P-923	Complete with Components		978002565
POTENTIOMETER BOARD (DWG 8)			
P-938	Complete with Components		978002581
PEDALBOARD (DWG 8)			
P-930	Complete with Components		978002572
IC1	Encoder	74C922	68000110
IC2	Nand Gate	4011	68000034
IC3	Nor Gate	4001	68000020
IC4	Divider	4727	68000041
IC5	Decoder	CD4515	68010162
IC6	Bass Gen.	3615	68000106
IC7 - IC10	Dual Op. Amp.	1458	68000053
IC8	Op. Amp.	741	68000059
IC9	O.T.A.	3080	68000066
TR1-TR2-TR4	TR.	BC173C	62120003
TR3	TR.	BC308	62210001
TR5-TR6-TR8	TR.	BC308	62210001
TR7	TR.	BC173C	62120003
D1 ÷ D5	Diodes	BA130	65000001
PEDALBOARD KEYSWITCHES (DWG 8)			
P-931	Complete with Components		978002573
FINAL PREAMPLIFIERS (DWG 9)			
P-934	Complete with Components		978002576
IC1 ÷ IC5	O.T.A.	3094	68000098
IC6 - IC7	Dual Op. Amp.	1458	68000053
IC8 ÷ IC10	Op. Amp.	741	68030141